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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/854,393
Filing Date: May 11, 2001
Appellant(s): RUMPF ET AL.

MAILED

FEB 09 2007

Technology Center 2600

James D. Leimbach
For Appellant

EXAMINER'S ANSWER

This is in response to an Amendment Appeal Brief under 37 C.F.R. 41.37(d) filed 11/15/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,580,579	Hsin et al.	06-2003
5,619,581	Ferguson et al.	04-1997

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1, 3, 5-9, 12-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsin et al. U.S. Patent No. 6,580,579 in view of Hsin et al's Admitted Prior Art.

Regarding claim 1, Hsin et al. discloses an apparatus having a control circuit, which comprises a feed-forward filter arrangement (See Abstract; col. 2, lines 28-40; col. 3, lines 54-63; col. 4, lines 4-7; Fig. 2, ref. #, 230,232),

and a controller (See col. 2, lines 41-67; col. 4, lines 12-15; Fig. 2, ref. #214),

characterized in that an adaptation of the parameters of the feed-forward filter arrangement are adapted by an adaptation algorithm during operation of the apparatus (See Abstract ;col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-48; Fig. 2,5, re# 230).

Hsin et al. does not expressly disclose, the parameters of the controller adapted by an adaptation algorithm.

However, this feature is well known in the art and is evidenced by Hsin et al's Admitted Prior Art, wherein an adaptation algorithm is used to adapt the parameters of the controller (See col. 2, lines 6-12).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to adapt the parameters of the controller with an adaptation algorithm in order to during operation of the apparatus, the apparatus set the parameters in response to disturbance signals and by the adaptation algorithm the controller is able to cancel and reject the undesired disturbances in real time instantly when the apparatus operates under disturbance environments, obtaining the best possible control performance and reducing errors.

Regarding claim 3, the combination of Hsin et al. and the Hsin et al's admitted prior art would show wherein the apparatus includes a disk drive for storage disk media (See Abstract; Fig. 1,2),

in which vibrations and internal disturbances, which occur during operation of the apparatus, are compensated by the adaptation algorithm optimizing the parameters of the feed-forward filter arrangement and the parameters of the controller (See Abstract ; col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-53; Fig. 2,5).

Regarding claim 5, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the controller comprises:

an input for receiving adapted control parameters, relative to variations in external disturbances of controlled device (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 4, lines 12-15; Fig. 2, ref. #214) and

a control variable output for supplying signals for controlling the controlled device responsive to both the error signal and the adapted control parameters (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 4, lines 12-15; Fig. 2, ref. #214, 216, 234).

Regarding claim 6, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the apparatus further comprises a storage media, in which vibrations and internal disturbances are compensated by the adaptation algorithm that adapts parameters of the feedforward filter arrangement, the parameters of the controller and the disturbance-variable feedforward (See Hsin et al col. 2, lines 6-12; col. 2, lines 41-67; col. 2, lines 6-12; col. 4, lines 12-15; Fig. 2).

Regarding claim 7, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the feedforward filter arrangement receives a disturbance signal from sensors and further comprising the disturbance signal being received by a computational element that performs the adaptation algorithm (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230),

wherein the computational element employs a current position reference from the storage device and an error reference from the storage device to adapt parameters of the feed forward filter arrangement and the controller (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230).

Regarding claim 8, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the computational element that performs the adaptation algorithm employs at least one control variable from the controller to adapt parameters of the feed forward filter arrangement and the controller (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230).

Regarding claim 9, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the controller and the feedforward filter arrangement are responsive to external events "such as" vibrations and temperature variations in components of the apparatus (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230).

Regarding claim 12, Hsin et al. discloses an apparatus for responding to effects on precision of positioning of a scanning element (See Abstract; col. 2, lines 28-40; col. 3, lines 54-63; col. 4, lines 4-7; Fig. 2) comprising:

a control circuit having a feedforward filter arrangement (See Abstract; col. 2, lines 28-40; col. 3, lines 54-63; col. 4, lines 4-7; Fig. 2, ref. #, 230,232);

a controller (See col. 2, lines 41-67; col. 4, lines 12-15; Fig. 2, ref. #214);

an adaptation algorithm (See Abstract ;col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-48; col. 4, line 54 to col. 7, line 16; Fig. 2,5, re# 230);

wherein parameters of the feedforward filter arrangement are adapted by the adaptation algorithm during operation of the apparatus (See Abstract ;col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-48; Fig. 2,5, re# 230).

Hsin et al. does not expressly disclose, the parameters of the controller adapted by an adaptation algorithm.

However, this feature is well known in the art and is evidenced by Hsin et al's Admitted Prior Art, wherein an adaptation algorithm is used to adapt the parameters of the controller (See col. 2, lines 6-12).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to adapt the parameters of the controller with an adaptation algorithm in order to during operation of the apparatus, the apparatus set the parameters in response of disturbance signals and by the adaptation algorithm the controller is able to cancel and reject the undesired disturbances in real time instantly when the apparatus operates under disturbance environments, obtaining the best possible control performance and reducing errors.

Regarding claim 13, the combination of Hsin et al. and the Hsin et al's admitted prior art would show a computational element, wherein the computational element performs the adaptation algorithm (See Abstract ;col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-48; Fig. 2,5, re# 230).

Regarding claim 14, the combination of Hsin et al. and the Hsin et al's admitted prior art would show wherein the controller comprises an error signal input, for receiving error signals responsive to operation of a controlled device; an input for receiving adapted control parameters, relative to variations in external disturbances of the controlled device; and a control variable output for supplying signals for controlling the controlled device responsive to both the error signal and the adapted control parameters (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 4, lines 12-15; Fig. 2).

Regarding claim 15, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the apparatus further comprises a storage media, in which vibrations and internal disturbances are compensated by the adaptation algorithm that adapts parameters of the feedforward filter arrangement, the parameters of the controller and the disturbance-variable feedforward (See Hsin et al col. 2, lines 6-12; col. 2, lines 41-67; col. 2, lines 6-12; col. 4, lines 12-15; Fig. 2).

Regarding claim 16, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the feedforward filter arrangement receives a disturbance signal from sensors and further comprising the disturbance signal being received by a computational element that performs the adaptation algorithm (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230),

wherein the computational element employs a current position reference from the storage device and an error reference from the storage device to adapt parameters of the feed forward

filter arrangement and the controller (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230).

Regarding claim 17, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the computational element that performs the adaptation algorithm employs at least one control variable from the controller to adapt parameters of the feed forward filter arrangement and the controller (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230).

Regarding claim 18, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the controller and the feedforward filter arrangement are responsive to external events "such as" vibrations and temperature variations in components of the apparatus (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230)

Regarding claim 20, the combination of Hsin et al. and the Hsin et al's admitted prior art show wherein the apparatus further comprises a storage disk media, in which vibrations and internal disturbances are compensated by the adaptation algorithm that adapts parameters of the feedforward filter arrangement, the parameters of the controller and the disturbance-variable feedforward (See Hsin et al col. 2, lines 6-12; col. 2, lines 41-67; col. 2, lines 6-12; col. 4, lines 12-15; Fig. 2).

Claims 2, 4, 10-11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsin et al. U.S. Patent No. 6,580,579 in combination with Hsin et al's Admitted Prior Art and further in view of view of Ferguson et al. U.S. Patent No. 5,619,581.

Regarding claims 2 and 19, the combination of Hsin et al. and the Hsin et al's admitted prior art would show all the limitations based on claim 1 and 12 as outlined above.

The combination would show an adaptation algorithm, but does not expressly show that the adaptation algorithm is executed on a microprocessor, particularly a digital signal processor.

However this feature is well known in the art as evidenced by Ferguson et al., which discloses a control system for cancellation vibration whereby the system includes an adaptation algorithm executed by a microprocessor, particularly a digital signal processor (See col. 3, lines 35-66; Fig. 2).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to execute the adaptation algorithm on a microprocessor, particularly a digital signal processor to adjust the parameters of the feed-forward filter and the controller in order to optimize faster adaptation calculations. as suggested by Ferguson et al.

Regarding claim 4, Hsin et al. discloses a method for responding to effects on precision of positioning of a scanning element in a disk drive (See Abstract; col. 2, lines 28-40; col. 3, lines 54-63; col. 4, lines 4-7; Fig. 2, ref. #, 230,232), the method comprising:

sensing forces acting the disk drive (See Abstract ; col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-53; Fig. 2,5).

converting detected forces into disturbances signals (See Abstract ; col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-53; Fig. 2,5),

applying the disturbances signals to a feed-forward filter to obtain a disturbance variable (See Abstract ; col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-53; Fig. 2,5);

adjusting the disk drive for errors using the controller (See col. 2, lines 41-67; col. 4, lines 12-15; Fig. 2, ref. #214);

receiving references variables, error signals , and control variables (See Abstract ; col. 2, lines 28-40; col. 4, lines 10-15; col. 4, lines 41-53; Fig. 2,5).

Hsin et al. does not expressly disclose applying and adapted version of the disturbance signals as parameters to a controller.

However, this feature is well known in the art and is evidenced by Hsin et al's Admitted Prior Art, wherein an adaptation algorithm is used to adapt the parameters of the controller applying an adapted version of the disturbance signals (See col. 2, lines 6-12).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to adapt the parameters of the controller with an adaptation algorithm in order to during operation of the apparatus, the apparatus set the parameters in response to disturbances signals and by the adaptation algorithm the controller is able to cancel and reject the undesired disturbances in real time instantly when the apparatus operates under disturbance environments, obtaining the best possible control performance and reducing errors.

The combination would show the adaptation of the controller parameters by using a "processor" (Something that processes things), where the adaptation calculation is executed (See

Fig. 2, block 230), but does not expressly show that the adaptation of the parameters is executed on a "processor"(Such as a microprocessor, digital signals processor-DSP, etc.).

However this feature is well known in the art as evidenced by Ferguson et al., which discloses a control system for cancellation vibration whereby the system includes an adaptation algorithm executed by a processor (See col. 3, lines 35-66; Fig. 2).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to execute the adaptation on a "processor", to adjust and/or altering the parameters of a feed-forward filter and the controller optimizing faster adaptation calculations, as suggested by Ferguson et al.

Regarding claim 10, The combination of Hsin et al., the Hsin et al's admitted prior art and Ferguson et al. shows the step of applying the adapted version of the disturbance signals as parameters to the controller further comprises applying an adapted version of the disturbance signals as parameters to the feed forward filter (See Hsin et al col. 2, lines 41-67; col. 2, lines 6-12; col. 3, line 25 to col. 4, line 52; Fig. 2, ref. #228, 230).

Regarding claim 11, The combination of Hsin et al. and the Hsin et al's admitted prior art and Ferguson et al. shows the step of providing outputs from the processor to alter parameters of the feed forward filter and the controller employs reference variables, error signals, and control variables to alter parameters of the feed forward filter and the controller (See Hsin et al. Abstract; col. 2, lines 28-40; col. 3, line 25 to col. 4, line 52; Fig. 2,5).

(10) Response to Argument

Appealed claim 1

Appellant argues that there is no disclosure or suggestion within Hsin et al. for the parameter of the feed forward filter arrangement and the parameters of the controller to be adapted by an adaptation algorithm during operation of the apparatus.

The examiner disagrees because the examiner clearly shows the *nexus* between the Hsin et al. teachings with the Hsin et al. admitted prior art that lead an ordinary skilled in the art as to obtain Appellant's claimed invention.

Hsin et al. discloses an apparatus having a control circuit as shown in Fig. 2 as an adaptive controller, which comprises a feed-forward filter arrangement (232), a controller (servo controller (214), and characterized in that an adaptation of the parameters of the feed-forward filter arrangement (232) are adapted by an adaptation algorithm (230) during operation of the apparatus. Hsin et al. has the desirability to obtain an adaptive controller, by adapting the parameters of the feed-forward filter arrangement (232). Hsin et al. does not expressly disclose that the parameters of the controller (servo controller 230) are adapted by the adaptation algorithm.

In Hsin et al.'s BACKGROUND OF THE INVENTION (Hsin et al.'s admitted prior art) disclose that an adaptation algorithm is used to adapt the controller parameters for the control the focus length of a disc player. One of an ordinary skill in the art would have understood that if a control is performed for a focus length of a disc player, it has to be performed when the disc drive is operated and performing focusing by the controller, hence during operation.

One of an ordinary skilled in the art would have been found obvious to adapt the parameters of the servo controller (230) by an adaptation algorithm as taught by Hsin et al.' s admitted prior art. And, as taught by Hsin et al. during operation of the apparatus, the apparatus set the parameters in response of disturbance signals and by the adaptation algorithm as to cancel and reject the undesired disturbances in real time instantly when the apparatus operates under disturbance environments, obtaining the best possible control performance and reducing errors.

Appellant argues that there is noting within Hsin et al. that would lead a person skilled in the art to believe that is possible to adapt the parameter to the controller during operation.

The examiner disagrees because Hsin et al.'s admitted prior art clearly disclose that is possible to use an adaptation algorithm to adapt the controller parameters of a controller that control the focus length of a disc player. And, one of an ordinary skill in the art would have understood that controller's parameters adapted during operation not only flows from a knowledge generally available to the ordinary skill in the art, but also <u>if a control is performed for a focus length of a disc player</u>, as taught by Hsin et al.'s admitted prior art, it has to be performed when the disc drive is operated and performing focusing by the controller, hence during operation.

Furthermore, as Appellant argues that there is no disclosure or suggestion within Hsin et al. to apply an adaptation algorithm to the controller.

The examiner disagrees because Hsin et al. admitted prior art clearly and specifically discloses apply an adaptation algorithm to a controller.

Appealed claims 3, 5, 6, 7, 9, 12, 14, 15, 19 and 20

Appellant argues that there is no disclosure or suggestion within Hsin et al. for the parameter of the feed forward filter arrangement and the parameters of the controller to be adapted by an adaptation algorithm during operation of the apparatus. The examiner disagrees for the same reasons as outlined above with claim 1.

Appellant argues that there is no disclosure or suggestion within Hsin et al.'s prior art for compensating anything during operation. The examiner disagrees, because the rejections are based on combinations of references, in this case Hsin et al. in combination with Hsin et al.'s admitted prior art, where Hsin et al. clearly and specifically discloses that vibrations and internal disturbances, external disturbances, external events, which occur during operation of the apparatus, are compensated by the adaptation algorithm optimizing the parameters of the adaptive controller. In fact Hsin et al.'s invention is for reject and compensate for this disturbances using an adaptive control scheme, as outlined above.

Appealed claims 8, 13, 16 and 17

Appellant argues that the combination of Hsin et al. with the prior art of Hsin et al. does not discloses or suggest a computational element that performs the adaptation algorithm.

The examiner disagrees because Hsin et al. clearly discloses a computational element (230) that performs the adaptation algorithm.

Appealed claims 2 and 19

Appellant argues that the combination made by the rejections is in error because Ferguson et al. does not disclose or suggest an adaptation algorithm is executed by a microprocessor and specifically a DSP. Appellant argues that the adaptation algorithm is not executed by the DSP.

The examiner disagrees because Ferguson et al. clearly and specifically discloses adaptation algorithm is executed on a microprocessor, particularly a digital signal processor (DSP). The DSP supplies the adaptation weights coefficients (i.e. parameters of the feed-0forward filter arrangement (26)), the DSP execute calculation for obtaining the parameters by executing an adaptation algorithm. In fact Ferguson et al. clearly and specifically discloses that the DSP calculates the weights coefficients (i.e. parameters of the feed-forward filter arrangement (26)) by executing particularly LSM adaptation algorithm. Appellant argument that Ferguson et al.'s adaptation algorithm is not executed by the DSP is in error.

Appealed claims 4, 10 and 11

Appellant argues that there is no disclosure or suggestion within Hsin et al. for the parameter of the feed forward filter arrangement and the parameters of the controller to be adapted by an adaptation algorithm during operation of the apparatus.

The examiner disagrees for the same reasons as outlined above with claim 1.

Appellant also argues that the combination made by the rejections is in error because Ferguson et al. does not disclose or suggest an adaptation algorithm is executed by a microprocessor and specifically a DSP.

Appellant argues that the adaptation algorithm is <u>not</u> executed by the DSP.

The examiner disagrees for the same reasons as outlined above with claim 2 and 19.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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